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ART. I.—*On Injuries of the Head.* By JOHN ASHHURST, Jr., M. D.,  
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to the Cuyler U. S. Army General Hospital.

THE diagnosis and treatment of injuries of the head have occupied the attention of medical writers from the days of Hippocrates to the present time, and yet there is no class of cases in which the surgeon finds so little that is reliable to guide him, and so much that is uncertain to mislead him. I propose to glance rapidly at some of the more frequent forms of injuries of the head, illustrating my remarks with apposite cases, and endeavouring to deduce some practical rules and principles for their treatment.

In wounds of the face, whether incised, lacerated, or contused, the edges should be brought closely together with sutures, for the tissues are so vascular that there is almost no risk of sloughing (as in the extremities), and the resulting deformity is apt to be much less by this plan than if the wound be permitted to heal by granulation. Almost the only cases where I can recall having obtained "union by the first intention," properly so called, have been wounds of the face or scalp. The best dressing for wounds of the face is unquestionably cold water.

CASE I. *Incised Wounds of Face produced by Broken Glass; Immediate Union.*—Mary T— was riding in a passenger car with her face turned towards the front window, when the car suddenly running off the track, her head was violently thrust through the pane of glass, which it shattered. A large piece of glass stuck into her face, and was thence removed; I found a deep incised wound on the right side of the nose, going down to the bone, and in all about two inches long. The bleeding was profuse, though no large vessel spouted. I washed away all dirt and fragments of glass, and closely approximated the edges with sutures, supported by isinglass plaster, and sent her to the Episcopal Hospital, with

instructions to the resident surgeon to keep cold water constantly applied. No other dressing was required. After a few days I removed the stitches, and found the wound completely united, really "by the first intention," there having been no suppuration whatever, and the cicatrix consequently being but slight, and not disfiguring.

In wounds of the scalp it is not necessary to employ sutures, as the parts can always be approximated closely without their use. The scalp should be shaved, and the wound washed as clean as possible; this is important, as any gravel or other dirt between the edges will necessarily prevent primary union.

The lips of the wound may be brought together with adhesive plaster, or better, with narrow strips of "Donna Maria" gauze, made to adhere to the scalp on either side by collodion, which may be most conveniently applied by means of a camel's-hair brush. The gauze should be first applied to one side of the wound, and, when the collodion is dry, should be firmly and smoothly drawn across, so as to bring the cut edges into contact through their whole extent. The dressing should now be completed by the application of a moderately thick compress, and a firm roller bandage. Ligatures need never be used in scalp wounds, no matter how profuse the hemorrhage; a compress and bandage are always sufficient to prevent bleeding. By moderate pressure upon a wound of the scalp, there is no cavity left in which the discharges can accumulate; on the other hand, by excessive pressure, any matter which may form will be forced to burrow between the scalp and the bone on either side of the compress; hence, the bandage for a scalp wound should be firm, but not tight.

Even if any untoward accident should prevent immediate union in scalp wounds, a very good cure may almost always be eventually obtained.

**CASE II. *Lacerated Scalp Wound.***—Gibbons, a boy of about eleven years, was admitted to the Pennsylvania Hospital on July 13, 1861, with a lacerated wound of the scalp, caused by his being struck by a cart-wheel. The wound formed two sides of a triangle, the scalp hanging down in a flap, and the skull being denuded of periosteum for a space of about three-quarters of an inch square.

The flap of scalp was replaced, gauze and collodion and a compress and bandage being applied in the manner indicated above. Everything went well, till in the next night but one after his admission, he was discovered with his head thrust through the hole of the fracture-bed on which he lay, and into his bed-pan, which was full of urine. The next day his face was greatly swollen, his eyelids closed, and the scalp around the wound soft and boggy. The dry dressing was now removed, and cold water substituted; of course, all hope of primary union had to be abandoned, but, under simple dressing, he made a good recovery without any sloughing or necrosis, and was discharged cured on August 26th, having been in the ward 44 days.

In wounds of the face complicated with fracture of the facial bones, union by adhesion is not to be anticipated; yet the soft parts should here

also be approximated by sutures, as the resulting line of cicatrix will be much narrower than if the wound be allowed to gape. Loose pieces of bone should be removed, and it may even sometimes be necessary to make a miniature resection before restoring the parts to their original position.

**CASE III. *Crushing Injury of the Face produced by a Blow.***—Mary K——, a woman past the middle age, was admitted to the Pennsylvania Hospital on March 26, 1862, having been struck on the face by her husband with a frying-pan or other hard utensil. Her nose was hanging down over her mouth, the nasal bones being fractured, and the posterior nares fairly exposed. In order to replace the nose in its proper position, I found it necessary to remove a portion of the projecting vomer with a pair of bone forceps. The nose was then replaced and attached with points of lead suture, cold water being constantly applied. She passed in a few days under the care of my friend and former colleague, Dr. Charles C. Lee, now of the regular army; but I saw her some time afterwards, and found that she had recovered with a nose useful though deformed, the cure having been effected by granulation.

So closely do the features depend for their form upon their bony supports, that the loss of even a very small portion of one of the facial bones will very generally entail a great disfigurement.

**CASE IV. *Injury of the Face from the Kick of a Horse.***—Jeremiah D——, aged 17 years, came into the Pennsylvania Hospital July 31, 1861, with lacerated wounds of the face, produced by the kick of a horse; on examination, one of the lachrymal bones was found to have been fractured. Lead sutures and cold water were employed, and the cure was completed by the 33d day, the patient being discharged Sept. 2. There was some distortion of the eye corresponding to the fractured lachrymal bone, and a marked depression over the site of the bone itself.

**CASE V. *Compound Fracture of the Malar Bone from a Blow.***—In the following case I find the result stated in my record as a “perfect cure,” implying that there was no perceptible deformity when the patient was discharged. Owen K——, aged seventy years, came into the Pennsylvania Hospital very drunk on Feb. 14, 1862. His injuries had been received by blows from a policeman’s billet. He had contused wounds of the cheek and brow, and a compound comminuted fracture of the left malar bone, some fragments of which were removed; lead sutures and cold water were employed, and the cure was completed on the 10th of March, the patient having been 24 days in the ward.

In wounds of the upper or lower lip it will generally be found best to introduce a hare-lip pin, in addition to the interrupted sutures. I confess my experience of wounds of the lip and of the hare-lip operation does not incline me to rely with Mr. Erichsen solely on the interrupted suture.

I shall say nothing of fractures of the lower jaw, as that bone may be looked upon rather as an appendage to than as a portion of the head.

Greatly more serious injuries of the head are those in which the cranium proper or bony envelope of the brain is involved. The skull varies greatly

in strength and thickness in different persons ; in some, a slight fall or blow may prove sufficient to produce fracture, while in others an accident much more severe in appearance may be innocuous. I have one case recorded of an Englishwoman, aged forty-five, who was brought to the Pennsylvania Hospital Oct. 16, 1861, with a small scalp wound ; the persons who brought her declared that she had fallen from a fourth story window upon a hard pavement, breaking through a balcony in her descent. The bone was deprived of periosteum for a small space, and when she became sober—for she was very drunk when admitted—she showed some slight symptoms of contusion of the brain, but her condition was never serious, and her recovery satisfactory, though slow ; she was discharged cured after 71 days' treatment.

I have said that injuries of the head in which the bone is involved are always extremely serious ; yet I may make the paradoxical assertion that fractures of the skull are not by themselves attended with danger. In fractures in any part of the body there are two things to be considered, viz., the condition of the bone and the condition of the soft parts ; and if the soft parts are properly looked after, the bone will generally take care of itself. So in fractures of the skull, the danger is not from the injury to the bone itself, but from the injury originally inflicted on the brain, or which may result to the brain from inflammation or its consequences. A man needs the bones of his leg to support his weight, and to enable him to walk, but, except for the protection of his brain, his skull is of very little use ; and hence, there are cases recorded where very large portions of the skull have been removed without any sensible inconvenience to the patient. As a case in point, I would instance the following, which I have translated and condensed from the report of M. Fuzier, in the *Recueil de Mémoires de Médecine, de Chirurgie, et de Pharmacie Militaires*, for July, 1863.

Plumeret, an Alsatian, of lymphatic temperament, and obtuse physical sensibility, but perfect *morale*, was attacked on the 2d of December, 1862, on the railroad in the neighbourhood of Tégéria, by four men, who knocked him down and gave him numerous blows on the head with a hatchet. They then threw a lasso around his neck and dragged him to a marsh, where they left him. He remained in a fainting condition during the night, and only regained his consciousness towards morning, having lost a great quantity of blood. He made his way to the road, and was picked up by the train going to Tégéria, where he received the first dressing.

On the evening of the 4th he was transferred by rail to the hospital at Vera Cruz, where his injuries were found to be as follows : A wound on the left side of the face from the upper part of the ear to the nostril ; the malar bone was divided. Another wound over the right eye, about two inches long ; a wound about four inches long on the back part of the right side of the head ; two wounds between two and three inches long on the top of the head. A wound about three and one-half inches long on the

right side of the forehead, oblique from above downwards, and from without inwards, and extending to the median line; from this wound a lozenge-shaped plate of bone had been removed about two inches and a half long by one and a half broad, and involving the whole thickness of the skull; in its inner side could be seen the groove of the meningeal artery. The dura mater could be seen in the wound beating synchronously with the heart's pulsations. There was still another wound, also nearly three and a half inches long, about three-quarters of an inch above the supra-orbital ridge, forming an angle with the preceding wound, which it almost met at its inner edge. From this wound was removed a fragment of bone which formed nearly the whole of the right supra-orbital ridge, but involved only the outer table of the skull.

The pulse was full, but natural; some headache; no stupor and no paralysis. The treatment consisted in cold to the head, which was elevated; purgatives, sinapisms, and low diet. With the exception of an intercurrent attack of intermittent fever, and another of acute dysentery, everything progressed favourably, and the patient left the hospital to return to France in the beginning of February, 1863, all the wounds being healed, except that from which the large plate of bone had been removed, which still gave issue to a very slight discharge.

This was one of many cases in which it has almost seemed as if the extensive injury to the bone had preserved the more important organ—the brain; in fact, when the skull gives way, the force of the blow producing the fracture is thus exhausted, and the brain receives comparatively little of its impulse; whereas, if the skull be strong enough not to be broken, the same blow transmitted to the brain will probably produce contusion and serious disorganization in that organ. Hence, in two injuries produced by an equal force, in one of which the skull is fractured, and the other not, the prognosis may be really more favourable in the former, for the brain is more likely to have escaped injury than when its bony case has not given way.

*CASE VI. Compound, Depressed Fracture of Skull with Compound Fracture of Lower Jaw and Fracture of Humerus; Recovery.*—George D., aged 33 years, an Englishman, was admitted to the accident ward of the Episcopal Hospital about 9 A. M. of Nov. 12, 1863. He had been picked up in an insensible condition on the track of the Trenton Railroad, having been injured in an unknown way at some time during the night. His stupor was profound, but evidently due in a great degree to liquor. I saw the patient about two hours later, and found his condition to be as follows: There was a lacerated and contused wound of the scalp in the right parietal region, about two inches in length. By introducing the finger the skull was found to have sustained an extensive depressed fracture. There was also a large wound extending from the right ear to the symphysis of the lower jaw, which was obliquely fractured near the angle of the right side with considerable comminution. There was in addition a frac-

ture of the inner condyle of the right humerus, which, however, was not detected for two or three days.

The case seemed quite hopeless, and the first dressing was applied more as a matter of routine than with any expectation of a second being required. The edges of the wound of the cheek were approximated with lead sutures; those of the scalp wound with adhesive plaster; compresses of sheet lint and a "Barton's bandage" applied with moderate firmness, and a cloth soaked in cold water placed to the head and kept constantly saturated. His dressing was thereafter renewed as often as cleanliness required until all danger of inflammation had passed, when warm water was substituted for cold, and the application made only to the wounds. The only constitutional treatment adopted was the administration of enough morphia to calm delirium and procure sleep. At first absolute diet was enjoined; nothing stronger than barley water being permitted, which, however, was given *ad libitum*; after a week or ten days, two or three tablespoonfuls of milk were allowed in the twenty-four hours; still later beef essence in moderate quantities, and finally nutritious food and even free stimulation with wine whey and brandy punch.

At one time profuse diarrhœa threatened to exhaust the patient, but was promptly checked by laudanum enemata. Two attacks of facial erysipelas occurred, one of which was attended with so much cerebral disturbance as to seriously endanger life; both, however, passed off without permanent traces. For many days delirium alternated with coma, and when both had passed away the mind was left in so feeble a condition as to be almost deranged. His mental state, however, improved nearly as quickly as his wounds healed; and when he left the house, Dec. 24, 1863, six weeks after admission, a slight occasional pettishness only remained to tell the tale of what his brain had gone through. His physical condition at the same time was eminently satisfactory; there was still some dead bone to come away from his jaw, which was disfigured by the large amount of callus thrown out. With this exception and the depression of the skull, which could plainly be felt through the scalp, he bore no traces of the severe injuries he had sustained.

I saw this patient respectively one month and two months after his discharge; his condition was about the same as at that time. He considered himself in perfect health, and had been drunk nearly every day since he had left the hospital.

**CASE VII. Simple depressed Fracture of Skull; Recovery.**—James H., aged eight years, a schoolboy, was admitted to the Pennsylvania Hospital, Aug. 27, 1861, having been hurt by a fall from a tree. He was found to have a simple depressed fracture of the left parietal bone. He was at no time insensible; his head was shaved, ice applied, and he was freely purged: he was discharged, cured, having had no bad symptoms at any time, on the 16th of September; having been under treatment twenty days.

Fractures of the skull over the region of the frontal sinus are perhaps more frightful in appearance than those of any other part; and meningitis sometimes occurs, giving to them, of course, a certain amount of risk; but, as a rule, they do well; their prognosis is more favourable than in fractures of any other part of the skull.

CASE VIII. *Compound Fracture of the Frontal Sinus; Recovery.*—George M. was admitted to the Pennsylvania Hospital, March 12, 1862, with a compound fracture of the frontal sinus, received from the kick of a horse: the whole outer table was destroyed as well as the orbital plates; the finger could be passed over both eyes and easily recognized the mucous lining of the sinus. The edges of the wound were brought together and cold water dressing applied, the patient being placed upon low diet. After about a week he became delirious, and in ten days violent, so that it was necessary to keep him in bed by mechanical restraint. He was now bled from the arm to the amount of eight fluidounces, and fluid extract of veratrum viride in doses of four drops given every three hours. A few doses brought the pulse down from 112 to 70 or 80, when the remedy was suspended; in four days more he was rational and quiet, his wound healthy and suppurating freely. He was discharged, cured, April 14th, having been under treatment thirty-three days.

One of my colleagues at the Cuyler General Hospital at Germantown, Dr. Robert N. Downs, has kindly shown me a patient of his who was wounded at Gettysburg, receiving a fracture of the frontal sinus, slightly to the right of the median line; the wound is still open, but Dr. Downs thinks it can eventually be closed by a plastic operation. The patient states that he has a constant ringing in the ears, and falls whenever he attempts to stoop.

Fractures of the base of the skull are more fatal than those of the vault; and the reason is that in the former the brain is generally more bruised and lacerated. This may be accounted for by the number of bony prominences in that part of the skull; the same fact on which depends the greater frequency of contusion of the base of the brain than of other parts, in cases where the bone is not broken.

CASE IX. *Fracture of Base of Skull; Life prolonged till Fourteenth Day; Autopsy.*—The following account is condensed from very full notes taken at the bedside of the patient, by Dr. Horace P. Middleton and Mr. Bodine, resident surgeons at the Episcopal Hospital. Thomas A., aged fifty-two years, an Irishman by birth, and by occupation a weaver, was admitted about midday of January 25th, 1864, with a fracture through the spine and body of the left scapula, and an injury of the head which was diagnosticated as fracture at the base of the skull, a diagnosis which was confirmed by *post-mortem* inspection. His injuries had been received by falling down a flight of stairs a short time previously. His left ear was filled with clotted blood, and there was marked ecchymosis both palpebral and orbital on the same side. The mouth was considerably distorted, being drawn to the right side, and his mind exhibited that uneasy pettishness and restlessness which sometimes accompany concussion or contusion of the brain. The fractured scapula was dressed in the usual manner, the patient put to bed, his head shaved, and a bladder filled with pounded ice applied. Absolute diet and the officinal solution of morphia to be given *pro re nata* constituted the rest of the treatment.

26th. A. slept tolerably well last night. This morning his tongue is covered with a white fur and he complains of nausea; pulse 74, and fuller

than yesterday (his tongue had been very dry, and his pulse 84, and weak). This evening he complained of great pain over the whole spine.

27th. Pain over the spine has disappeared. A. is disposed to sleep all the time; he has passed his urine several times involuntarily; his bowels were opened by an enema.

28th. Complains of nausea and headache; is unable to close the left eye except when asleep, when it closes of itself.

30th. He is allowed a moderate quantity of milk; he is quite deaf, especially on the left side; delirious.

Feb 1. Facial erysipelas on the right side; orbital ecchymosis has disappeared; pulse ranges from 100 to 120. Give wine whey and beef essence, afterwards milk punch. Lungs very much congested. About this time began a profuse watery discharge from his left ear, which continued up to within a few hours of his death.

4th. Pulse can hardly be counted, being very frequent, and masked by his jactitation and subsultus.

6th. Comatose; respirations 27 to the minute, pulse 68. Died about 7 A.M. of Sunday, Feb. 7th.

*Autopsy* 36 hours after death. Rigor mortis but slight; great emaciation; excoriations of trunk from his having scratched himself; a bed-sore over the sacrum. There was much blood effused around the left scapula, which presented a fracture passing transversely through its spine, and becoming radiated and comminuted in its body. There had been no attempt at union. Within the cranium there was considerable bloody intermeningeal effusion, the membranes and the brain itself being also much congested, and the membranes presenting a slight lymph deposit. There was a radiated fissure through the petrous portion of the left temporal bone, extending into the orbit; the brain itself was somewhat lacerated in the region corresponding to the fracture. The other organs were not examined.

These are the most serious cases of head wounds that are met with in civil hospitals; but injuries that appear very slight will occasionally result fatally. I reported a case of death following an ordinary scalp wound in the number of the *American Journal of Medical Sciences* for January, 1864, and a similar case, in which metastatic abscesses were found, was reported by Dr. Hutchinson to the Pathological Society of Philadelphia, and may be found in their Proceedings for Sept. 22, 1858.

Sometimes scalp wounds are followed by necrosis, in which sequestra are thrown off involving the whole thickness of the bone. I treated a soldier at the army hospital at Chester, who had received a simple gunshot wound of the scalp, in which, however, hospital gangrene setting in, the bone became involved, and when the necrosed part had come away, the pulsations of the brain could easily be seen at the bottom of the wound. When I lost sight of this man he was doing guard duty without the slightest inconvenience. Dr. Downs, of the Cuyler Hospital, showed me a portion of the left parietal bone, the size and shape of the crown of a trephine which had been exfoliated from the skull of one of his patients. This man had no brain symptoms remaining, except hebetude and slowness of thought.

A good deal of space is usually devoted in systematic works on surgery



to the supposed diagnostic marks which distinguish *concussion* from *compression* of the brain. But I think we are coming now to look upon *concussion* as a misnomer; the cases usually classed under that designation are really *contusion* of the brain, and these contusions, like those in any other part of the body, may vary in intensity from the slightest bruise to the most extensive and dangerous disorganization. And as bruises in other parts of the body, when not so severe as to cause instant or very rapid destruction, are of consequence from the risk of subsequent inflammation, so in contusion, or, as it used to be called, concussion of the brain, if the patient survives the first shock, inflammation is what is to be guarded against; and in many cases the treatment of concussion and compression must be the same.

There are certain remedies and modes of treatment in injuries of the head, and especially in fractures of the skull, which have become venerable by age, and which are hence liable to be adopted as correct, without its being considered if they are really commended by science and experience. I propose very briefly to consider the most prominent of these, and to state, as modestly as possible, my own convictions concerning them.

And first, as to trephining, or trepanning: that the operation has been often successful (that is to say that patients have recovered after it) of course cannot be denied; but it is doubtful if they might not have recovered without it. Desault bored a great many men's heads, and they all died; he then gave up boring men's heads, and they all, or nearly all, got well. To elevate a depressed piece of bone is desirable, but so many cases recover where the bone remains depressed, and so many die where it is elevated by trephining, that the remedy has proved, in such cases, hardly an assistance to nature. The products of inflammation have been occasionally evacuated by trephining, but there have been so many unsuccessful and fatal cases, on the other side, that I think very few surgeons now would resort to the operation in this contingency. Of thirty-five cases in which the trephine had been used in our army, from September, 1862, to March 31st, 1863, twenty-eight died, two remained undecided, and but five had recovered; and it is not impossible that some of these might have recovered equally without operation. I do not say that I would never use the trephine; but I do say, unhesitatingly, that I have never seen a case where I think its use would have been justifiable. I would, of course, remove all loose fragments, and if I could elevate a depressed portion of bone without too much interference, I would do so, but beyond this I should be disposed to leave the case to nature.

Bleeding is another remedy which has been very largely employed in injuries of the head, and is still recommended even by those who forego its use in other cases; and yet I think it is hardly indicated either by reason or experience. A clot on the brain will not be relieved by bleeding, nor will bleeding prevent a clot's formation. The results of bleeding in inflamma-

tions of other organs have not been so favourable as to lead us to resort to it from analogy in inflammation of the brain; and bleeding as a prophylactic appears to me as irrational as it is cruel. I believe free stimulation is more often required in fracture of the skull than the use of the lancet. I have, indeed, recorded in this paper a case of fractured frontal sinus, which recovered after bleeding; but I should be loth to infer that the bleeding was the cause of that recovery.

Calomel and tartar emetic have been much used in injuries of the head, and Desault's experience with large doses of the latter was extremely favourable to its employment. But I imagine there are but few surgeons now who would be inclined to push it to the same extent that he did. If inflammation occur in these cases, I should be disposed to regard calomel in small doses as a remedy which might possibly be of use. But I cannot see the propriety of giving it in large amounts, as has been done, to every man that may have a broken skull.

The course, then, which I would pursue in a case of fractured skull or contused brain, would be as follows: If the case were a compound fracture, I would remove any fragments that were detached, and if a portion of bone could be elevated without dangerous interference, would restore it to its proper position. I would place the patient in bed, in a darkened room, with his head shaved, and cold locally applied. I am convinced that the profession does not appreciate the great advantages to be derived from cold, and especially dry cold, in surgical cases. I consider it second to no remedy in the treatment of injuries of the brain. Taking the view that I do, that the danger in these cases is from inflammation, I would endeavour to obviate any causes that might excite it, and to keep the system in a condition as well prepared to meet it as possible. As these accidents generally occur to men in robust health, and as there has generally been but little hemorrhage, the diet may, for the first few days, be very limited. There has been no drain upon the system as in other surgical injuries, and the risk of exhaustion and fatal debility is, therefore, less. I should not, however, hesitate, if it was indicated by the symptoms, to resort to free stimulation from the outset; and it will generally be necessary to have recourse to it in the progress of the case. I should use opium, in some form, freely in almost every case. I cannot understand the fear of opium in injuries or inflammation of the brain. The same principles which induce its administration in peritonitis make it suitable in these cases. I would therefore "put the brain in splints," if the expression may be allowed, by the use of opium.

But the most important thing is to carefully watch the case from day to day, and to endeavour, in the words of Dr. Watson, to "obviate the tendency to death." If coma be threatened, a few cups or a small blister to the back of the neck may be of service. Derivation from the bowels by means of purgatives may be sometimes particularly indicated. An attack of facial

erysipelas (a mark of constitutional depression) will call for the use of wine or brandy; and in short every case must be studied for itself, taking into view its natural history, so to speak, and its pathology, with all the lights that can be derived from reason, analogy, and experience.

In conclusion, I would say a few words as to two symptoms which are supposed to characterize fractures at the base of the skull. These are orbital ecchymosis, and bloody or watery discharges from the ear or nostril. Now neither of these is pathognomonic, and though, of course, their concurrence would make the diagnosis very probable, they might both be present, and yet no fracture exist. Orbital ecchymosis shows merely that a vessel is ruptured within the orbit; and this may occur in connection with a fracture of the malar or superior maxillary, as in a case published by Mr. Holmes, and referred to by Mr. Hewett in his admirable monograph on injuries of the head, or even without any fracture at all, as in the case of McAllister, reported by myself in the *Proceedings of the Pathological Society of Philadelphia*, vol. ii. p. 115 (*Am. Journ. of Med. Sci.* for July, 1862, p. 112). Similarly a bloody or watery discharge may proceed from the cavity of the tympanum alone, without any fracture of the skull, as in cases reported respectively by Mr. Gray and Mr. Hewett.

I have said nothing about hernia cerebri, because it is of rare occurrence, and when it is met with, should, I think, be treated as simply as possible, and without mechanical meddling or disturbance.

PHILADELPHIA, April 8, 1864.

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ART. II.—*Gunshot Fracture of Superior Maxilla, and Wound of Internal Maxillary Artery—Ligature of the Common Carotid Artery—Paralysis with Convulsions of opposite Side, after 35 days—Death after 41 days—Abscesses of the Brain.* By W. W. KEEN, JR., Acting Assistant Surgeon U. S. A.

CORPORAL C., 20th Mass., æt. 33; in the service 2 years; health excellent; was admitted to Ward No. 2., Satterlee U. S. A. General Hospital, West Philadelphia, July 11, 1863.

He had been wounded July 1st, 1863, at Gettysburg, by a minie ball, which entered  $1\frac{3}{4}$  inch below, and a little to the left of the left eye, and lodged just behind the first upper molar of the same side, partially destroying the left palatine arch, and knocking out the last two molars, and the corresponding portion of the alveolar process. The ball remained lodged in the jaw for two days, and fell, on the third day, into the mouth, when he secured it. Six days after receiving the wound he had an attack of secondary hemorrhage, and the day before his admission a second.

On admission, the wound looked exceedingly healthy, suppuration and cicatrization went on well, under cold water dressing and ordinary soft diet, and considerable debris of bone was discharged from the posterior wound.